

Appl. No. 09/447,301
Amtd. Dated October 17, 2006
Reply to Office Action of April 17, 2006

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A solid-state image-pickup device having:

a sensor array comprising a plurality of sensors; and

a plurality of transfer registers for transferring signal charges from said sensors of said sensor array,

at least one horizontal-horizontal transfer register is formed between said transfer registers for storing temporarily and transferring said signal charges;

wherein a read-out gate is provided between the sensor array and an accumulation gate, the accumulation gate is provided between said sensor array the read-out gate and said transfer registers for ~~reading out signal charges from said sensors at a same time~~, accumulating said signal charges and allocating said signal charges to said transfer registers and further wherein said plurality of transfer registers include two transfer registers which receive and concurrently transfer said signal charges from at least two rows of pixels of said sensor array.

2. Canceled

3. (Previously Presented) A solid-state image-pickup device according to claim 1, wherein said accumulation gate creates a difference in electric potential oriented in a direction of transfer.

Appl. No. 09/447,301
Amtd. Dated October 17, 2006
Reply to Office Action of April 17, 2006

4. (Previously Presented) A solid-state image-pickup device according to claim 1 wherein signal charges of said sensors are stored in said accumulation gate to be allocated in units of electrical charge each originated by one of said sensors.

5. (Previously Presented) A solid-state image-pickup device according to claim 1 wherein signal charges of said sensors are allocated to respective transfer registers for each odd sensor and each even sensor of said sensor array.

6. (Currently Amended) A method of driving a solid-state image-pickup device having:

a sensor array comprising a plurality of sensors;

a plurality of transfer registers for transferring signal charges from said sensors of said sensor array;

at least one horizontal-horizontal transfer register formed between said transfer registers for storing temporarily and transferring said signal charges;

a read-out gate are provided between the sensor array and
an accumulation gate, the accumulation gate provided between said sensor array read-
out gate and said transfer registers,

said method comprising the steps of:

reading out signal charges from all of said sensors in a row closest to said accumulation gate at a same time via the read-out gate;

Appl. No. 09/447,301
Amdt. Dated October 17, 2006
Reply to Office Action of April 17, 2006

allocating said signal charges of said sensors from said accumulation gate to said transfer registers; and

driving said transfer registers to output said signal charges and further wherein said plurality of transfer registers include two transfer registers which receive and concurrently transfer said signal charges from at least two rows of pixels of said sensor array.

7. (Original) A method of driving a solid-state image-pickup device according to claim 6 whereby said transfer registers are driven at the same time.

8. (Previously Presented) A method of driving a solid-state image-pickup device according to claim 6 whereby signal charges of said sensors are allocated to respective transfer registers for each odd sensor and each even sensor of said sensor array.

9. (Previously Presented) The solid-state image-pickup device according to claim 1, wherein said horizontal-horizontal transfer register has a same number of columns as said transfer registers.

10. (Previously Presented) The method of driving a solid-state image-pickup device according to claim 6, wherein said horizontal-horizontal transfer register has a same number of columns as said transfer registers.

Appl. No. 09/447,301
Amdt. Dated October 17, 2006
Reply to Office Action of April 17, 2006

11. (Previously Presented) The solid-state image-pickup device according to claim 2, said accumulation gate and said read-out gate share a common gate electrode.

12. (Previously Presented) The method of driving a solid-state image-pickup device according to claim 6, wherein said step of reading out and said step of allocating are carried out through a common gate electrode.

13. (Currently Amended) A solid-state image-pickup device having:
a sensor array comprising a plurality of sensors; and
a plurality of transfer registers for transferring signal charges from said sensors of said sensor array,

at least one horizontal-horizontal transfer register is formed between said transfer registers for storing temporarily and transferring said signal charges;

wherein a read-out gate is provided between the sensor array and an accumulation gate, the accumulation gate is provided between the read-out gate and said sensor array and said transfer registers for reading out signal charges from said sensors at a same time, accumulating said signal charges and allocating said signal charges to said transfer registers, the accumulation gate being directly connected to the sensor array via a the readout gate without any vertical transfer registers between the sensor array and the accumulation gate and further wherein said plurality of transfer registers include two transfer registers which receive and concurrently transfer said signal charges from at least two rows of pixels of said sensor array.

Appl. No. 09/447,301
Amdt. Dated October 17, 2006
Reply to Office Action of April 17, 2006

14. (Currently Amended) A method of driving a solid-state image-pickup device having:

a sensor array comprising a plurality of sensors;

a plurality of transfer registers for transferring signal charges from said sensors of said sensor array;

at least one horizontal-horizontal transfer register formed between said transfer registers for storing temporarily and transferring said signal charges;

a read-out gate provided between the sensor array and an accumulation gate, the accumulation gate provided between said read-out gate sensor array and said transfer registers, the accumulation gate being directly connected to the sensor array via a the readout gate without any vertical transfer registers between the sensor array and the accumulation gate;

said method comprising the steps of:

reading out signal charges from all of said sensors in a row closest to said accumulation gate at a same time via the read-out gate;

allocating said signal charges of said sensors from said accumulation gate to said transfer registers; and

driving said transfer registers to output said signal charges and further wherein said plurality of transfer registers include two transfer registers which receive and concurrently transfer said signal charges from at least two rows of pixels of said sensor array.

Appl. No. 09/447,301
Amtd. Dated October 17, 2006
Reply to Office Action of April 17, 2006

Please add the following new claims:

15. The solid-state image-pickup device according to claim 1, wherein the read-out gate and the accumulation gate are comprised of a same material.
16. The solid-state image-pickup device according to claim 13, wherein the read-out gate and the accumulation gate are comprised of a same material.
17. The solid-state image-pickup device according to claim 1, wherein the read-out gate transmits all received signals from the sensor array to the accumulation gate and the accumulation gate subsequently transfers all of the signals to the transfer registers.
18. The solid-state image-pickup device according to claim 1, wherein the read-out gate transmits all received signals from the sensor array to the accumulation gate and the accumulation gate subsequently transfers all of the received signals to the transfer registers.